# ELECRAFT KX1 MAINTENANCE GUIDE

OR HOW TO LOOK LIKE YOU BUILT THE THING EVEN IF YOU DIDN'T
BY CRAIG RAIRDIN, NZ0R

## INTRODUCTION

There probably won't be any need to repeat any of the alignment steps, disassemble the radio, or do anything more than change the batteries. This guide doesn't necessarily lead you through all the steps of every procedure but instead points you to the right place in the manual and gives you some tips in case you ever have to do it. It also provides some procedures that aren't really spelled out in the manuals anywhere (such as disassembly/reassembly). Page numbers are based on the Rev B manual.

## CHANGING THE BATTERIES

- Remove the two thumb screws from the back of the KX1.
- If necessary, disconnect the red/black power wires from the connector on the main pc board.
- Replace the batteries.
- Make sure you reconnect the power connector and be careful not to pinch the wires under a stand-off as you re-close it.
- Reinstall the two thumb screws. It is easy to cross-thread them. Get one started, then do the other before tightening the first.

## RECEIVER ALIGNMENT

You can easily adjust the band-pass filters for optimum receiver performance. It is essential that you have a plastic screwdriver, especially for the 30m adjustment. The procedure is on page 45 of the manual (and is continued in the KXB3080 manual) but can be summarized as follows.

- Open the KX1 (see "Changing the Batteries" above). It's easiest if you can remove the back entirely and use an external power supply instead of trying to work around the batteries.
- Turn both RF Gain and Filter fully clockwise.
- Connect a speaker or headphones and turn on the power.
- Tune to a weak signal around 14100 kHz (weak enough that you don't activate AGC)
- Locate the holes in the board labeled 20A and 20B. Alternately adjust these trimmer caps for the best signal.
- Switch to 40m and find a weak signal around 7100 kHz.
- Adjust the trimmer in the hole labeled 40.
- Switch to 30m and find a weak signal around 10100 kHz.
- Alternately adjust the trimmers in holes labeled 30A and 30B.
- There is no separate adjustment for 80m.

## CALIBRATING OPERATING FREQUENCY

This procedure is on page 68 of the manual. It's easiest to use WWV at 10 MHz to do this test. It's a bit of a challenge to figure out when you're at "zero beat". It's easiest to do at the top of the minute while they're making the time announcement so you don't have to contend with the other tones.

Put the VFO into 10 Hz steps and slowly tune until the carrier pitch goes down and disappears. Make a note of that frequency, then keep tuning until you hear it come back up on the other side. They're usually about 200 Hz apart. Take the average and use that as the zero-beat frequency for the rest of the calculations for the BFO setting. You can use a similar procedure for DDS calibration.

## CALIBRATING THE POWER AND SWR READINGS

This shouldn't be necessary but the procedure is in the KXAT1 manual on page 7.

You need a known-good watt meter to calibrate the power reading. You can use the Elecraft DL1 Dummy Load and a volt meter to get a pretty good estimate of power by measuring the voltage across the test points and doing the math in the manual to calculate power.

Make sure to set the ATU menu setting back to TUN when done.

## DISASSEMBLING THE ENTIRE RADIO

- Remove the paddle, if connected.
- Remove the two thumb screws from the back.
- Remove the back and disconnect the red/black power connector from the pc board.
- The KXAT1 antenna tuner is a narrow board that runs along one side. Lift it from both ends to remove it. There are two connectors on one end of the board (one 2-pin and one 3-pin) and one connector (5-pin) on the other end.
- Turn the radio face-up and use the included hex wrench to remove the VFO knob.
- Remove the two Phillips screws, one on the left and one on the right of the front panel.
- Remove the nylon screw that is under the VFO knob. Note that this screw holds the final amplifier transistor against its heat sink. It must not be replaced with a metal screw or it could short the transistor to ground. ***Note:*** There is a black nylon shoulder washer in the hole in the tab of the transistor. Make sure this washer is present when you reassemble the radio. It prevents the tab from shorting to ground.
- Turn the radio over. It's easiest if the circuit board has not moved from its position from when it was attached to the front panel. Grab the paddle connector and pull it away from the hole in the side that the paddle plugs in, while using your other hand to gently pull that edge of the case open a little farther to allow the paddle jack to clear the edge of the hole. Again, if the opposite side of the board (the side where the KXAT1 mounts) is lifted first, it will be impossible to get the jack to clear the hole.

# REASSEMBLY

Essentially, it is the reverse of disassembly.

- Before putting the main board back in the front panel, make sure the nylon shoulder washer is still on the final transistor tab.
- Place the main board back in place, making sure the VFO shaft and buttons line up with their holes. You'll have to pull the paddle side out so the jack can get down to the hole. You may also have to use a small screwdriver to make sure the three blue buttons aren't stuck behind the front panel.
- Reinsert the nylon slotted screw and the two metal Phillips screws on the front panel. Make sure the screw that holds the final transistor in place is nylon, not metal.
- Reattach the VFO knob.
- Reinstall the KXAT1 antenna tuner board. Make sure all the pins are in the connectors. Note that some of the pin shaft will still be visible when fully inserted.
- Reconnect the power connector and be careful not to pinch the wires as you install the two thumb screws that hold on the back cover.
- Reinsert the paddle and screw it in place.